## NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

ID R-2552B

STATE PROJECT NO. SHEET NO. TOTAL SHEETS 8.T311002 2 63

## DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

## SUBSURFACE INVESTIGATION

## SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	TERMS AND DEFINITIONS	ABBREVIATIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED. SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED	WELL GRADED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.		BLDR BOULDER PL - PLASTIC LIMIT
WITH A CONTINUOUS FLIGHT POWER AUGER. AND WHICH YIELDS LESS THAN 188 BLOWS ACCORDING TO STANDARD PENETRATION	UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO	ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.	
TEST (ASTN D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE:	POORLY GRADED) GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.	APPARENT DIP - THE DIP OF ROCK STRATA NOT PERPENDICULAR TO STRIKE.	CL CLAY PI - PLASTICITY INDEX
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION AND OTHER PERTINENT FACTORS, SUCH AS, MINERALOGICAL	ANGULARITY OF GRAINS	AQUIFER - A WATER BEARING FORMATION OR STRATA.	COB COBBLE n - POROSITY
COMPOSITION, ANGULARITY STRUCTURE, PLASTICITY, ETC. EXAMPLE: VERY STIFF, GRAY SULTY CLAY, MOIST WITH INTERGEOCED FINE SAND	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS, ANGULAR,	AUGER REFUSAL (A.R.) - POINT AT WHICH POWER AUGERS WILL NOT PENETRATE.	CSE COARSE SD SAND
UNERS, HIGHY PUSTIC, A-7-6.	SUBANGULAR, SUBROUNDED, OR ROUNDED.	BEDDED - SOIL OR ROCK LYING IN A POSITION ESSENTIALLY PARALLEL.	EST ESTIMATED SAT SATURATED
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	BEDROCK - ROCK OF RELATIVELY GREAT THICKNESS AND EXTENT IN ITS ORIGINAL LOCATION.	F FINE SL SILT, SILTY
CENTERAL CRANIII OR MATERIAL C. CILT.CLAY MATERIAL C.	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN	CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.	FOSS FOSSILIFEROUS SLI SLIGHTLY
CLASS. (≤ 35% PASSING •200) (> 35% PASSING •200) ORGANIC MATERIALS	DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	COHESIVE SOIL - A SOIL THAT WHEN UNCONFINED HAS CONSIDERABLE DRY STRENGTH AND SIGNIFICANT COHESION WHEN SUBMERGED.	FRAC FRACTURED G <sub>S</sub> - SPECIFIC GRAVITY
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	COMPRESSIBILITY	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT	GR GRAVEL QU - UNCONFINED COMPRESSIVE STRENGTH
CLASS. A-1-AA-1-B A-2-4A-2-5A-2-6A-2-7 A-7-5 A-3 A-6, A-7	SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30	BOTTOM OF SLOPE.	II - ITOITO LIMIT
SYMBOL 000000000000000000000000000000000000	MODERATELY COMPRESSIBLE LIQUID LIMIT 31-50	CORE RECOVERY (% REC.) - TOTAL LENGTH OF ALL ROCK DIVIDED BY TOTAL LENGTH OF CORE	MED MEDIUM  7 - UNIT WEIGHT (WET UNIT WEIGHT)
51MBUL 0000000000	HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	RUN AND EXPRESSED AS A PERCENTAGE.	w - MOISTURE CONTENT 7d - DRY UNIT WEIGHT
A PASSING GRANULAR SILT- MUCK.	ROCK DESCRIPTION	COQUINA - A ROCK TYPE COMPOSED ESSENTIALLY OF MARINE SHELLS CEMENTED BY CALCIUM CARBONATE.	MOT MOTTLED
• 10 DU MX	IN THE BROADEST MEANING, HARD ROCK IS CONSIDERED THAT MATERIAL WHICH CANNOT BE	DIKE - IGNEOUS ROCK INTRUSION WHICH IS NARROW COMPARED WITH ITS OTHER DIMENSIONS.	OM - OPTIMUM MOISTURE
• 200 15 MX25 MX10 MX35 MX35 MX35 MX35 MX36 MN36 MN36 MN36 MN	SAMPLED BY CONVENTIONAL SOIL SAMPLING TOOLS OR TECHNIQUES. THE BOUNDARY BETWEEN SOIL AND ROCK IS ARBITRARY. TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED	DIP - THE ANGLE BETWEEN A BEDDING PLANE, JOINT PLANE OR FAULT PLANE AND THE	ORG ORGANIC V VERY
LIQUID LIMIT 49 MXI41 MNI49 MXI41 MNI49 MXI41 MNI49 MXI41 MNI COLL C WITH	BY A ZONE OF 'WEATHERED ROCK', FOR THE PURPOSE OF THIS INVESTIGATION, THESE	HORIZONTAL, MEASURED PERPENDICULAR TO THE STRIKE.	VI 12.11
PASTIC INDEX 6 MX N.P. 10 My 10 My 11 MN 11 MN 10 MY 11 MN 11 MN	MATERIALS ARE DIVIDED AS FOLLOWS:	DUMPS - UNCOVERED DEPOSITS OF WASTE MATERIAL SUCH AS WOOD, MASONRY DEBRIS OR GARBAGE.	
HIGHLY	13 163 163	FAULT - A BREAK IN THE CONTINUITY OF A BODY OF ROCK, ATTENDED BY A MOVEMENT ON	0411M4011 110M40H
AMOUNTS OF SOILS	WEATHERED DIFFICULTY USING POWER AUGERS AND YIELDS	FINES - PORTIONS OF A SOIL FINER THAN NO. 200 U.S. STANDARD SIEVE.	CAUTION NOTICE :
USUAL TIPES SILVE FRAUS FINE SILTY OR CLAYEY SILTY CLAYEY DRGANIC	ROCK SPT VALUES > 100 BLOWS BUT < SPT REFUSAL	FISBILITY OR FISSILE - A PROPERTY OF SPLITTING EASILY ALONG CLOSELY SPACED PARALLEL	THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS MADE
OF MAJOR GRAVEL AND SAND GRAVEL AND SAND SOILS SOILS MATTER	(SWR) HARD MATERIAL THAT CAN BE PENETRATED WITH GREAT	PLANES.	FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES.
GEN. RATING	WEHTHERED DIFFICULTY USING FOWER HOUERS HIND TEEDS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED	SOME DATA OBTAINED MAY BE OMITTED FROM THIS RELEASE.
AS A   EXCELLENT TO GOOD   FAIR TO POOR   POOR   POOR   UNSUITABLE		FROM PARENT MATERIAL.	ADDITIONAL INFORMATION MAY BE AVAILABLE, INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:
SUBGRADE	TOOK AND TO THE TENER OF THE PROPERTY AND THE PROPERTY AN	FLOODPLAIN - LAND BORDERING A STREAM. BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.	
P.I. OF A-7-5 ≤ L.L 30 : P.I. OF A-7-6 > L.L 30	(HR) (HR) (HR) (HR) (HR) (HR) (HR) (HR)	FORMATION - A MAPPABLE UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.	FIELD BORING LOGS
CONSISTENCY OR DENSENESS  RANGE OF STANDARD RANGE OF UNCONFINED	*SPT REFUSAL ≤2.5cm OF PENETRATION PER 50 BLOWS.	FRACTURE - A CRACK LARGE ENOUGH TO BE VISIBLE TO THE UNAIDED EYE.	ROCK CORES SOIL & ROCK TEST DATA
PRIMARY SOIL TYPE COMPACTNESS OR DENETRATION DESISTENCE COMPRESSIVE STRENGTH	"" AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH AUGERS COULD NO LONGER	FRIABLE - EASY TO BREAK OR CRUMBLE.	SUBSURFACE REPORT
CONSISTENCY (BLOWS) (kN/m²)	PENETRATE. THE HARD ROCK SYMBOL IS SHOWN WHEN ROCK IS CORED AND ONLY TO THAT	GRANULAR MATERIAL - SOIL THAT WHEN UNCONFINED HAS LITTLE OR NO DRY STRENGTH AND HAS	THE INFORMATION MAY BE VIEWED BY ADDONOUTHENT BY CONTACTION THE N. O. DEDIGATION OF
VERY LOOSE <4	DEPTH CORED. A DESCRIPTION OF ROCK IS GIVEN INCLUDING.	LITTLE OR NO COHESION WHEN SUBMERGED.	THIS INFORMATION MAY BE VIEWED BY APPOINTMENT BY CONTACTING THE N.C.DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL UNIT @ (919) 250-4088, NEITHER THE SUBSURFACE PLANS AND REPORT
GENERALLY LOOSE 4 TO 10	CORE RECOVERY (REC.) - TOTAL LENGTH OF ROCK RECOVERED IN THE CORE BARREL DIVIDED		NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS PART OF THE CONTRACT.
GRANULAR MEDIUM DENSE 10 TO 30 N/A MATERIAL DENSE 30 TO 50	BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%.	OF GRAVITY.	
VERY DENSE >50	ROCK QUALITY DESIGNATION (ROD) - TOTAL LENGTH OF SOUND ROCK SEGMENTS RECOVERED	GROUNDWATER LEVEL - LEVEL OF WATER WITH RESPECT TO EXISTING GROUND SURFACE.	GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY
	THAT ARE LONGER THAN OR EQUAL TO 0.1m DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%.	HARDPAN - A GENERAL TERM USED TO DESCRIBE A HARD CEMENTED SOIL LAYER WHICH DOES	REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA
SOFT 2 TO 4		₫	WITHIN THE BOREHOLE, THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE
OCINEMICAL MEDIUM STIFF 4 TO 8 50 TO 100	GROUND WATER	INDURATED - EARTH MATERIAL HARDENED BY HEAT, PRESSURE OR CEMENTATION.	RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD.
MATERIAL 311FF 0 10 10 200	₩ATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.	INTERBEDDED - ALTERNATING LENSES OR LAYERS OF SOIL AND/OR ROCK MATERIALS.	THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL
MRTERIAL VERY STIFF 15 TO 30 200 TO 400 HARD >30 >400	▼ STATIC WATER LEVEL AFTER 24 HOURS.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.	MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING
	PERCUED WATER CATURATER TONE OR WATER READING STRATA	LAMINATED - VERY THIN ALTERNATING LAYERS LESS THAN ICM.	TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.
TEXTURE OR GRAIN SIZE	PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA	LAYER - SUBJECT MATERIAL GREATER THAN I om IN THICKNESS.	
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	SPRING OR SEEPAGE	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED	THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT, FOR BIDDING
OPENING (MM) 4.76 2.0 0.42 0.25 0.075 0.053		TO ITS LATERAL EXTENT.	AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIG
POWER CORRECT COARSE FINE CLAY	MISCELLANEOUS SYMBOLS AND ABBREVIATIONS	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.	INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENC
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	ROADWAY EMBANKMENT  WITH SOIL DESCRIPTION  POT TEST BORING  DESIGNATIONS	MARL - A NON-INDURATED, CALCAREOUS DEPOSIT OF CLAYS, SILTS AND SANDS, OFTEN	OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE OR OPINIONS OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR
	- LI TIM SOLE BESCHIEFTON	CONTAINING SHELLS.	CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS
GRAIN MM 305 75 2.0 0.25 0.05 0.005	SOIL SYMBOL AUGER BORING S- BULK SAMPLE	MICACEOUS SOIL (MIC.) - A SOIL OR ROCK TYPE CONTAINING AN APPRECIABLE AMOUNT OF MICA.	NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE
SEZË IN. 12' 3"	SS- SPLIT SPOON	MUCK (MK.) - A HIGHLY ORGANIC SOIL OF VERY SOFT CONSISTENCY, GENERALLY FOUND ON	CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR
SOIL MOISTURE - CORRELATION OF TERMS	ARTIFICIAL FILL OTHER THAN CORE BORING SAMPLE	TIDAL FLATS, LAKE OR STREAM FLOODPLAINS,	ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION	ST- SHELBY TUBE	PEAT (PT) - A FIBROUS MASS OF ORGANIC MATTER IN VARIOUS STAGES OF DECOMPOSITION.	71002 11001120 111 112 00000111102 1111 011111111
(ATTERBERG LIMITS) DESCRIPTION OFFICE SESSITION	MONITORING WELL SAMPLE	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE	NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	INFERRED SOIL BOUNDARIES  RS- ROCK SAMPLE	OF AN INTERVENING IMPERVIOUS STRATUM.	OF TRANSPORTATION AS BEING ACCURATE NOR IS IT CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.
(SAT.) FROM BELOW THE GROUND WATER TABLE	PIEZOMETER  ALLUVIAL/RESIDUAL BOUNDARIES  PIEZOMETER  TINSTALLATION	RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.	aracurionistic, on contents for the raciaci.
LL_ LIQUID LIMIT	100000000000000000000000000000000000000	ROCK - SEE LEGEND	NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS
PLASTIC   SEMISOLID: REQUIRES DRYING TO	DIP DIRECTION AND DIP OF STRUCTURES SLOPE INDICATOR •- SOUNDING ROD	ROCK QUALITY DESIGNATION (R.O.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL	FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE
(DI)     ATTAIN OPTIMUM MUISTORE	INSTALLATION	LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN O.I METER DIVIDED BY THE TOTAL LENGTH OF CORE RUN EXPRESSED AS A PERCENTAGE.	CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
PLASTIC LIMIT	APPARENT DIP SPT N-COUNT	SANITARY LANDFILLS - COMPACTED AND/OR COVERED LAYERS OF SOIL AND WASTE PRODUCTS.	
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE		SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF	NOTES:
OM _ OPTIMUM MOISTORE	EQUIPMENT USED ON SUBJECT PROJECT	THE PARENT ROCK.	
REQUIRES ADDITIONAL WATER TO	DRILL UNITS: AUGER TOOLS: HAMMER TYPE:	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A	
- DRY - (D) ATTAIN OPTIMUM MOISTURE		FAULT OR SLIP PLAIN.	
	MOBILE B 6° (152 mm) CONTINUOUS FLIGHT AUTOMATIC MANUAL	SILL - AN IGNEOUS SHEET OF INTRUSIVE ROCK WHOSE THICKNESS IS SLIGHT COMPARED TO	
PLASTICITY INDEX DRY STDENICTH	BK-51 S* (203 mm) HOLLOW AUGERS CORE BORING TOOLS:	TITS LATERAL EXTENT.	
PLASTICITY INDEX DRY STRENGTH		SOME - PRESENCE OF 5% TO 30% OF SUBJECT MATERIAL.	
NONPLASTIC 0-5 VERY LOW	CME-45 HARD FACED FINGER BITS -AX -BX -NX	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N) OF A 63,5 kg HAMMER FALLING 0,76 METERS REQUIRED TO PRODUCE A PENETRATION OF 30 cm INTO SOIL WITH A	
LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM	CME-550 TUNG CARBIDE INSERTS HAND TOOLS.	5 cm OUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION RESISTANCE OF LESS	
MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH		THAN 2.5 cm WITH 50 BLOWS.	
COLOR	-     PORTABLE HOTST     CLAY BLIS	STRIKE - THE DIRECTION OR BEARING OF A HORIZONTAL LINE IN THE PLANE OF AN	
CULUK	HAND AUGER	INCLINED STRATUM, JOINT, FAULT OR OTHER STRUCTURAL PLANE.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY)	OTHER OTHER SOUNDING ROD	SUBGRADE - THE SOIL PREPARED TO SUPPORT A STRUCTURE OR A PAVEMENT SYSTEM.	
MODIFIERS SUCH AS LIGHT, DARK, MOTTLED, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE		TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.	REVISED NOVEMBER II, 199
	OTHER VANE SHEAR TEST	TRACE - PRESENCE OF LESS THAN 5% OF SUBJECT MATERIAL.	